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| 10/591,036 | 08/29/2006 | Koji Katano | 128477 | 5830 |
| 25944 7590 01/05/2011 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850 | | | | |
| EXAMINER | | | | |
| LEE, CYNTHIA K | | | | |
| ART UNIT | | PAPER NUMBER | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OfficeAction25944@oliff.com
jarnstrong@oliff.com

Office Action Summary

Application No.

10/591,036

Applicant(s)

KATANO, KOJI

Examiner

CYNTHIA LEE

Art Unit

1726

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3, 5, 6, 8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5, 6, 8 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/22/2010 has been entered.

Response to Amendment

This Office Action is responsive to the amendment filed on 7/22/2010. Claims 1, 3, 5, 6, 8, 10 are pending. Claims 1, 3, 5, 6, 8, 10 have been amended. Applicant's arguments have been fully considered and are persuasive. However, upon further consideration, the instant claims are rejected under new grounds of rejections. Claims 1, 3, 5, 6, 8, 10 are non-finally rejected for reasons stated herein below.

Support for claim 1 amendment "the dynamic calculation being based on ... a required electricity generation amount" can be found in the instant Specification [0015, 0016].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 5, 6, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iio (US 2003/0027024) in view of Yamanashi (US 6632552).

Regarding claims 1 and 6, Iio discloses a control apparatus and a method for a fuel cell including an oxidizing gas supplying unit 7 configured to supply an oxidizing gas to a cathode via an oxidizing gas supply line of the fuel cell, and a hydrogen supplying unit 4 configured to supply hydrogen to an anode via a hydrogen supply line of the fuel cell, the anode having a buildup of impurities (nitrogen, carbon dioxide, [0035]) over time causing a presence of residual gas, the control apparatus comprising:

a target hydrogen partial pressure determining unit configured to dynamically calculate [0078] a target hydrogen partial pressure regarding a hydrogen pressure among a gas mixture in the anode (nitrogen, carbon dioxide, [0035]), the dynamic calculation being based on a required electricity generation amount [0080],

a hydrogen supply pressure calculating unit configured to calculate a hydrogen supply pressure of hydrogen to be supplied to the fuel cell based on the calculated target hydrogen partial pressure [0080]; and

a hydrogen supply control unit 10 configured to regulate the supply of hydrogen from the hydrogen supplying unit to the fuel cell at the calculated hydrogen supply pressure [0032].

Regarding claims 1 and 6, lio does not disclose a cathode-side gas pressure detecting unit configured to detect a cathode-side gas pressure within at least one of the oxidizing gas supply line and the cathode;

the dynamic calculation being based on the detected cathode- side gas pressure;

a hydrogen supply pressure calculating unit configured to calculate a hydrogen supply pressure of hydrogen to be supplied to the fuel cell based on the detected cathode-side gas pressure,

and the method performing the abovementioned functions.

Regarding claims 1 and 6, Yamanashi teaches that the compressor for the air, the reformer for the fuel, the air flow control valve, and the hydrogen control valve are controlled such that the pressures at the anode side and the cathode side of the fuel cell stack and the pressure difference between the anode side and the cathode side do not exceed the allowable limits to prevent an electrolytic membrane from being ruptured. This control is repeatedly carried out at successive sampling intervals (4:30-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to dynamically control and calculate the anode supply of lio based on the cathode air pressure for the benefit of not exceeding the amount of air required by the fuel cell.

Regarding claims 5 and 10, lio discloses an exhaust unit 61 configured to discharge residual gas remaining within the anode and the hydrogen supply line;

an exhaust control unit configured to discharge the residual gas using the exhaust unit when the hydrogen supply pressure is not within a tolerance range for gas pressure on the anode side [0038, 0039]; and

a residual gas partial pressure calculating unit 44 configured to calculate a partial pressure of the residual gas remaining within the anode and the hydrogen supply line when the residual gas is discharged [0040], wherein

the hydrogen supply pressure calculating unit calculates the hydrogen supply pressure of the hydrogen to be supplied to the fuel cell based on the calculated target hydrogen partial pressure and the calculated residual gas partial pressure [0040].

lio modified by Yamanashi teaches the hydrogen supply pressure calculating unit calculates the hydrogen supply pressure of the hydrogen to be supplied to the fuel cell based on the detected cathode-side gas pressure.

lio discloses that when the hydrogen concentration in the anode effluent recirculation passage 8 is lower than the predetermined concentration, the hydrogen pressure is also lower than a predetermined pressure [0038]. Thus, it is noted that lio discloses of measuring the residual gas concentration or the residual gas partial pressure.

Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over lio (US 2003/0027024) in view of Yamanashi (US 6632552) as applied to claim 1 or 6, further in view of Motozono (US 6638652).

lio modified by Yamanashi teaches all the elements of claims 1 and 6 and are incorporated herein. lio modified by Yamanashi discloses the hydrogen supply pressure

calculating unit calculates the hydrogen supply pressure of the hydrogen to be supplied to the fuel cell based on the detected cathode-side pressure.

lio modified by Yamanashi does not teach an apparatus having a fuel cell temperature detecting unit configured to detect a temperature of the fuel cell; and

a correcting unit configured to correct the calculated target hydrogen partial pressure based on the detected temperature of the fuel cell to yield a corrected target hydrogen partial pressure, wherein

the hydrogen supply pressure calculating unit calculates the hydrogen supply pressure of the hydrogen to be supplied to the fuel cell based on the corrected target hydrogen partial pressure,

and a method performing the abovementioned functions.

Motozono teaches the power generation efficiency of these fuel cells varies with the temperature or humidity of the electrolyte, and the output increases depending on the supply amount of the fuel gas and oxidizing gas, and therefore in order to produce a required electric quantity efficiently, it is important to control the running conditions and the supply gas amounts (1:33-38). It would have been obvious to one of ordinary skill in the art at the time the invention was made to correct and calculate the supply of the hydrogen gas, or the oxidant gas, or both, based on the operating temperature of the fuel cell of lio modified by Yamanashi for the benefit of efficiently generate electrical power.

Response to Arguments

Applicant's arguments filed 7/22/2010 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Lee/
Examiner, Art Unit 1795